2009 WASHINGTON STATE ENERGY CODE AND 2009 INTERNATIONAL RESIDENTIAL CODE
RESIDENTIAL ENERGY AND VENTILATION SUBMITTAL FORM

Applicant: _____ Application #: _____ Date: _____

Job Type: ☐ New ☐ Addition ☐ Remodel Conditioned Square Feet: _____

Occupancy: ☐ Single Family / Duplex ☐ Residential Care / Assisted Living / Adult Family Home

2009 WSEC CHAPTER 6 TABLE 6-1

Option	Glazing % of Floor Area	Glazing U-Factor		Door U-Factor	Vaulted Ceilings w/o Attics	All Other Ceilings	Walls Above Grade	Walls @ Interior Below Grade	Walls @ Exterior Below Grade	Floors Over Unheated Space	Slab On Grade
		Vertical	Overhead								
☐ 1	13%	0.34	0.50	0.20	R-38	R-49 or R-38 Adv	R-21	R-21 w/ TB	R-10	R-30	R-10
☐ 2	25%	0.32	0.50	0.20	R-38	R-49 or R-38 Adv	R-21	R-21 w/ TB	R-10	R-30	R-10
☐ 3	Unlimited	0.30	0.50	0.20	R-38	R-49 or R-38 Adv	R-21	R-21 w/ TB	R-10	R-30	R-10
*Ch 4/5	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____

TB = Thermal Break Adv = Advanced Framing * Supporting documentation required

2009 WSEC CHAPTER 9 TABLE 9-1

Dwelling units shall develop **one point** from the following options. Include Option 7 if applicable. **See list on the back of this form.**

☐ Not Applicable (Additions less than 750 s.f.)

☐ 1a (1.0 pts) ☐ 1c (1.0 pts) ☐ 3a (0.5 pts) ☐ 3c (2.0 pts) ☐ 4b (1.0 pts) ☐ 5b (1.5 pts) ☐ 7 (-1.0 pts)

☐ 1b (2.0 pts) ☐ 2 (1.0 pts) ☐ 3b (1.0 pts) ☐ 4a (0.5 pts) ☐ 5a (0.5 pts) ☐ 6 (1.0 pts) ☐ 8 (0.5 pts)

CONDITIONED SQ. FT. _____ X GLAZING % _____ = _____ SQ. FT. ALLOWED GLAZING
(Including Overhead w/ U > 0.35)

VAPOR RETARDERS:

CRAWLSPACE		☐ 6-mil Black Poly	☐ 3½" Concrete Slab	☐ N/A
FLOORS	☐ 4-mil Poly	☐ Face Stapled Backed Batts	☐ Ext. T&G Plywood	☐ 6-mil Poly (Slab On Grade Floor)
WALLS	☐ 4-mil Poly	☐ Face Stapled Backed Batts	☐ *Vapor Barrier Primer	☐ N/A (R-5 Exterior Rigid Ins.)
CEILINGS	☐ 4-mil Poly	☐ Face Stapled Backed Batts	☐ *Vapor Barrier Primer	☐ N/A (≥ 12" Vent Space Over Ins.)
			* Perm Rating ≤ 1.0	☐ N/A (All Insul. On Roof Deck)

VENTILATION SYSTEM:

Each dwelling unit shall be equipped with **one** of the ventilation systems listed below. **Additional system information available.**

☐ **Not Applicable (Additions less than 500 s.f.)**

☐ **Whole-House Exhaust Fan with fresh air port (net 4 sq. in. minimum opening) at each habitable room.**
A timer operates an exhaust fan which pulls outside air through air inlets located in each habitable room.

☐ **Integrated System with fresh air duct connected to return air duct of forced-air heating system.**
A timer operates the furnace blower and a motorized outside air inlet damper to distribute outside air through the heating ducts.

☐ **Supply Fan with fresh air duct connected to supply air duct or return air duct of forced-air heating system, or other ducts.**
A timer operates a supply fan connected to an outside air duct to distribute outside air through the heating ducts or other ducts.

☐ **Heat Recovery System.**
A timer operates a heat recovery ventilator (HRV) to distribute outside air to habitable rooms through dedicated ducts.

☐ **Designed System per IMC with calculations and/or performance testing. Includes: ☐ Whole-house fan ☐ Fresh air ports**
Typically such systems must be designed, installed, tested, and balanced by a mechanical engineer or other HVAC professional.

Continuously operating exhaust ventilation systems shall provide the minimum flow rates specified in Table M1508.2.
Intermittently operating exhaust ventilation systems shall provide flow rates per Table M1508.2 as modified by Table M1508.3.

***** Please complete the System Ventilation Rate calculation on the back of this form. *****

AIR TESTING:

☐ **Duct Leakage Test** *Required when space-conditioning equipment is installed, altered, or replaced (including replacement of air handler, outdoor unit of air conditioner or heat pump, cooling or heating coil, or furnace heat exchanger).*

☐ **Building Leakage Test** *Required for additions greater than or equal to 750 s.f. and for all new construction.*

***** Must be verified by on-site testing with specialized equipment. *****

TABLE M1508.2 MINIMUM VENTILATION RATES
(Continuously Operating Systems)

Floor Area (ft^2)	Bedrooms[1]				
	0-1	2-3	4-5	6-7	>7
<1500	30	45	60	75	90
1501 – 3000	45	60	75	90	105
3001 – 4500	60	75	90	105	120
4501 – 6000	75	90	105	120	135
6001 – 7500	90	105	120	135	150
>7500	105	120	135	150	165

[1]Ventilation rates in table are minimum outdoor airflow rates measured in CFM.

M1508.3 Intermittently Operating Ventilation Systems. The delivered ventilation rate for intermittently operating ventilation systems shall be the combination of its delivered capacity from Table M1508.2, and its ventilation effectiveness and daily fractional operation time from Table M1508.3.

$$Q_f = Q_r / (\varepsilon f)$$

Where:

Q_f = Outdoor air flow rate
Q_r = Ventilation air requirement (from Table M1508.2)
ε = Ventilation effectiveness (from Table M1508.3)
f = Fractional operation time (from Table M1508.3)

TABLE M1508.3 VENTILATION EFFECTIVENESS FOR INTERMITTENT FANS

Daily Fractional Operation Time, f	Ventilation Effectiveness, ε
f ≤ 35%	0.33
35% ≤ f < 60%	0.50
60% ≤ f < 80%	0.75
80% ≤ f	1.0

For systems designed to operate at least once every three hours, ventilation effectiveness can be 1.0.

TABLE M1508.6.2 PRESCRIPTIVE SUPPLY FAN DUCT SIZING

Supply Fan Tested CFM at 0.40" W.G.		
Specified Volume from Table M1508.2	**Minimum Smooth Duct Diameter**	**Minimum Flexible Duct Diameter**
50-90 CFM	4 inch	5 inch
90-150 CFM	5 inch	6 inch
150-250 CFM	6 inch	7 inch
250-400 CFM	7 inch	8 inch

*** CALCULATING OUTSIDE AIR REQUIREMENTS FOR VENTILATION SYSTEMS ***

Ventilation Air Requirement (from Table M1508.2) _____ cfm
Daily Fractional Operation Time, **f** (System ON ____ Hours Per Day ÷ 24) ÷ _____
Ventilation Effectiveness, **ε** (from Table M1508.3) ÷ _____

System Ventilation Rate (Fan Size and/or Balancing Requirement) = _____ cfm

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2009 WSEC CHAPTER 9 TABLE 9-1

OPTION	DESCRIPTION	PTS	OPTION	DESCRIPTION	PTS
1a	HIGH EFFICIENCY HVAC EQUIPMENT 1: Gas, propane, or oil-fired furnace or boiler with minimum AFUE of 92%, **OR** Air-source heat pump with minimum HSPF of 8.5.	1.0	4a	AIR LEAKAGE CONTROL AND EFFICIENT VENTILATION: Envelope leakage reduced to SLA of 0.00020, **AND** All whole house ventilation requirements shall be met with a heat recovery ventilation system.	0.5
1b	HIGH EFFICIENCY HVAC EQUIPMENT 2: Closed-loop ground source heat pump with a minimum COP of 3.3.	2.0	4b	AIR LEAKAGE CONTROL AND EFFICIENT VENTILATION: Envelope leakage reduced to SLA of 0.00015, **AND** All whole house ventilation requirements shall be met with a heat recovery ventilation system.	1.0
1c	HIGH EFFICIENCY HVAC EQUIPMENT 3: In home where the primary space heating system is zonal electric heating, a ductless heat pump system shall be installed and provide heating to at least one zone of the housing unit.	1.0	5a	EFFICIENT WATER HEATING: Gas, propane, or oil water heater with a minimum EF of 0.62, **OR** Electric Water Heater with a minimum EF of 0.93, **AND FOR BOTH CASES** All showerheads and kitchen sink faucets shall be rated at 1.75 GPM or less. All other lavatory faucets shall be rated at 1.0 GPM or less.	0.5
2	HIGH EFFICIENCY HVAC DISTRIBUTION SYSTEM: All heating and cooling system components installed inside the conditioned space. All combustion equipment shall be direct vent or sealed combustion. Under this option locating system components in conditioned crawl spaces is not permitted, electric resistance heat is not permitted, and direct combustion heating equipment with AFUE less than 80% is not permitted.	1.0	5b	HIGH EFFICIENCY WATER HEATING: Gas, propane, or oil water heater with a minimum EF of 0.82, **OR** Solar water heating supplementing a minimum standard water heater to provide a rated minimum savings of 85 therms or 2000 kWh based on the Solar Rating and Certification Corporation Annual Performance of OG-300 Certified Solar Water Heating Systems, **OR** Electric heat pump water heater with a minimum EF of 2.0.	1.5
3a	EFFICIENT BUILDING ENVELOPE 1: Prescriptive compliance is based on Table 6-1, Option 3 with the following modifications: Window U = 0.28, Floor R-38, Slab On Grade R-10 (full), Below Grade Slab R-10 (full), **OR** Component performance compliance: Reduce the Target UA from Table 5-1 by 5%, as determined using EQUATION 1.	0.5	6	SMALL DWELLING UNIT: Dwelling units less than 1,500 square feet in floor area with less than 300 square feet of window + door area. Additions to existing building that are less than 750 square feet of heated floor area.	1.0
3b	EFFICIENT BUILDING ENVELOPE 2: Prescriptive compliance is based on Table 6-1, Option 3 with the following modifications: Window U = 0.25, Wall R-21 + R-4, Floor R-38, Slab On Grade R-10 (full), Below Grade Slab R-10 (full), and Below Grade Basement Walls R-21 + R-5, **OR** Component performance compliance: Reduce the Target UA from Table 5-1 by 15%, as determined using EQUATION 1.	1.0	7	LARGE DWELLING UNIT: Dwelling units exceeding 5,000 square feet of floor area shall be assessed a deduction for purposes of complying with Section 901 of the Washington State Energy Code.	-1.0
3c	EFFICIENT BUILDING ENVELOPE 3: Prescriptive compliance is based on Table 6-1, Option 3 with the following modifications: Window U = 0.22, Wall R-21 + R-12, Floor R-38, Slab On Grade R-10 (full), Below Grade Slab R-10 (full), Below Grade Basement Walls R-21 + R-12, and Advanced Ceiling/Vault R-49, **OR** Component performance compliance: Reduce the Target UA from Table 5-1 by 30%, as determined using EQUATION 1.	2.0	8	RENEWABLE ELECTRIC ENERGY: For each 1200 kWh of electrical generation provided annually by on-site wind or solar equipment a 0.5 credit shall be allowed, up to 3 credits. Designs for solar electric systems shall be demonstrated to meet this requirement using the National Renewable Energy Laboratory calculator PVWATTs. Documentation noting solar access shall be included on the plans. Designs for wind generation projects shall document annual power generation based on the wind turbine power curve, average annual wind speed at the site, frequency distribution of the wind speed at the site, and height of the tower.	0.5